

What Is Claimed Is:

1. A method of producing a video recording with improved dynamic range comprising:

providing a video camera comprising a video detector capable of converting an optical image into a sequence of video fields or frames, and an electronic shutter for adjusting the amount of light received by said detector from an optical image viewed by said camera;

operating said camera to capture an optical image;

commanding said electronic shutter to vary the amount of light received by said video detector from said captured optical image whereby to produce from said detector an output video signal constituting a sequence of video fields or frames representing the captured optical image, with said sequence comprising at least first and second fields or frames representing different exposure values of the captured image occurring repetitively in said sequence according to a predetermined repetition frequency;

processing said output video signal so as to produce a modified video signal consisting of a continuous sequence of said first fields or frames or a continuous sequence of said second fields or frames; and

selectively applying said modified video signal as an input signal to a video display apparatus whereby to cause said apparatus to display said captured optical image according to the first or second fields or frames contained in said modified video signal.

2. A method according to claim 1 further including the step of recording said output video signal for use subsequently to drive a display means so that

said captured optical image may be displayed according to the information contained in said first or second fields or frames.

3. A method of producing a video recording with improved dynamic range comprising:

providing a video camera comprising a video detector capable of converting an optical image into a sequence of video fields or frames, and an electronic shutter for adjusting the amount of light received by said detector from an optical image viewed by said camera;

operating said camera to capture an optical image;

commanding said electronic shutter to vary the amount of light received by said video detector from said captured optical image whereby to produce from said detector an output video signal constituting a sequence of video fields or frames representing the captured optical image, with said sequence comprising at least first and second fields or frames representing different exposure values of the captured image occurring repetitively in said sequence according to a predetermined repetition frequency;

recording said output video signal in a recording medium;

subsequently playing said output video signal out of said recording medium;

processing said output video signal played out of said recording medium so as to produce a modified video signal consisting of a continuous sequence of said first fields or frames or a continuous sequence of said second fields or frames; and

selectively applying said modified video signal as an input signal to a video display apparatus whereby to cause said apparatus to display said

captured optical image according to the first or second fields or frames contained in said modified video signal.

4. A method of producing a video recording with improved dynamic range comprising:

providing a video sensor capable of converting an optical image into a video signal comprising a sequence of video fields or frames representing the optical image;

operating said video sensor to capture an optical image and simultaneously varying the amount of light received by said video sensor during the time frame of each video field or frame so that the resulting video signal representing said captured optical image will constitute a sequence of video fields or frames comprising at least first and second fields or frames representing substantially different exposure values of the captured image occurring repetitively in said sequence;

deriving from said resulting video signal a modified video signal comprising a continuous sequence of said first fields or frames or a continuous sequence of said second fields or frames;

and applying said modified video signal to a display means whereby said captured optical image is displayed according to the video information contained in said modified video signal.

5. A method according to claim 4 further including the step of recording said resulting video signal for use subsequently to drive a display means so that said captured optical image may be displayed according to the information contained in said first or second fields or frames.

6. A method according to claim 4 wherein said modified video signal is produced by processing said resulting video signal so as to blank out said second fields or frames and replacing said blanked-out second fields or frames with said first fields or frames.
7. A video camera system comprising:
- a video camera for capturing an optical image and producing an output video signal that characterizes a continuous sequence of video fields or frames representing the captured image, said camera comprising a video detector means for generating said output video signal according to the light received from said image, and exposure control means for adjusting the amount of light received by said video detector from the optical image;
 - an exposure controller for said exposure control means so as to vary the amount of light on a video field or frame basis, whereby said output video signal characterizes an alternating sequence of at least first and second fields or frames of substantially different exposures; and
 - means responsive to said output video signal for accomplishing one or more of the following actions: (a) producing a video display in response to only said first fields or frames; (b) producing a video display in response to only said second fields or frames; and (c) recording said output video signal for use subsequently to produce a video display in response to said first fields or frames or said second fields or frames.
8. A video camera system according to claim 7 wherein said last-mentioned means produces a first video display according and in response to said first fields or frames and a second concurrent display according and in response to said second fields or frames.

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9. A video camera recording system comprising:
- a video camera for capturing an optical image and producing an output video signal that characterizes a continuous sequence of video fields or frames representing the captured image, said camera comprising a video detector means for generating said output video signal according to the light received from said image, and exposure control means for adjusting the amount of light received by said video detector from the optical image;
- an exposure controller for said exposure control means so as to vary the amount of light on a video field or frame basis, whereby said output video signal characterizes an alternating sequence of at least first and second fields or frames of different exposures;
- recorder means for recording and playing back said output video signal;
- signal processing means coupled to said recorder means for receiving said output video signal as it is read out of said recorder means and deriving therefrom a modified video signal comprising a sequence of only said first video fields or frames or only said second video fields or frames; and
- means responsive to said modified video signal producing a video display in accordance with said sequence of first or second fields or frames.
10. A video camera system in accordance with claim 9 wherein said first and second fields or frames are produced non-sequentially.
11. A video camera system in accordance with claim 9 wherein said first and second fields or frames are produced non-sequentially and recorded in the order in which they are produced.

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12. A video camera system in accordance with claim 9 wherein said first and second fields or frames are produced in a consistent repetitive sequence in which the period of repetition is greater than or equal to the period of two video fields or frames.
13. A video camera system in accordance with claim 9 wherein said video detector means comprises a CCD or MOS device.
14. A video camera system comprising:
- means for producing a series of video signals representing a sequence of video fields or frames of a selected optical image with at least certain of the video fields or frames comprising data representing a first exposure level and others of said fields or frames comprising video data representing a second greater or lesser exposure level; and
- means for processing and utilizing said video signals to provide a flicker free video display of said selected optical image.
15. A video camera system according to claim 14 wherein said certain video fields or frames are interspersed in said sequence among said other fields or frames.
16. A video camera system according to claim 14 wherein said last-mentioned means comprises a multiplexer for blanking said certain fields or frames that comprise data representing said first exposure level and replacing said blanked fields or frames with fields or frames comprising data representing said second exposure level, whereby to produce a modified

video signal; and further comprising means for applying said modified video signal to a video display means to provide a flicker free video display of said optical image according to the data representing said second exposure level.

17. A method for capturing and displaying video images comprising:
 - using a video camera to generate a video signal output that defines a continuous sequence of video fields or frames representing a captured optical image, with at least first and second fields or frames representing the image captured with first and second different exposure times respectively, and said first and second fields and frames being produced in a consistent repetitive sequence with said first video fields or frames being interspersed in said continuous sequence among said second video fields or frames;
 - processing said video signal output to provide (1) a first modified video signal that defines a continuous sequence of said first fields or frames, and (2) a second modified video signal that defines a continuous sequence of said second fields or frames; and
 - utilizing said first and second modified video signals to produce separate displays of said captured optical image according to the exposures represented respectively by said first and second fields or frames.

18. A method of producing a video recording with improved dynamic range comprising:

- providing a video sensor capable of converting an optical image into a video signal comprising a sequence of video fields or frames representing the optical image;
 - operating said video sensor to capture an optical image and simultaneously varying the amount of light received by said video sensor

during the time frame of each video field or frame so that the resulting video signal representing said captured optical image will constitute a sequence of video fields or frames comprising at least a plurality of first fields or frames representing a first exposure value of the captured image and a plurality of second fields or frames representing a second exposure value of the captured image, with said first fields or frames being interspersed among said second fields or frames in said sequence;

deriving from said resulting video signal a modified video signal comprising a continuous sequence of said first fields or frames or a continuous sequence of said second fields or frames; and

applying said modified video signal to a display means whereby said captured optical image is displayed according to the video information contained in said modified video signal.

19. A method of recording and displaying video images comprising;
capturing a series of successive video images using different exposure times, with the exposure times varying according to a predetermined pattern so that video images captured using a first exposure time are interspersed in said series with video images captured using a second different exposure time;

producing a video signal representing said series of video images in the order that they are captured; and

using said video signal to generate a video display of the video images captured using only said first exposure time.

20. A method according to claim 19 further including the step of using said video signal to generate a second video display of the video images captured using only said second exposure time.

21. A method according to claim 20 wherein said displays are presented simultaneously by a common display device.